

AMENDMENTS TO THE CLAIMS

1-14. (Cancelled)

15. (New) A control method for an arc welding apparatus comprising a voltage detector, a voltage change amount detection part, a neck determination part and a neck prohibiting detection part, the method comprising:

detecting a welding voltage using the voltage detector;

calculating dv/dt using the voltage change amount detection part, wherein dv/dt is a change amount of the welding voltage per unit time;

determining whether a neck of a droplet is formed by comparing the calculated dv/dt with a positive threshold value using the neck determination part;

comparing the calculated dv/dt with a negative threshold value using the neck prohibiting detection part; and

sending a first neck detection prohibiting signal from the neck detection prohibiting part to the neck determination part in response to a determination by the neck prohibiting detection part that the calculated dv/dt is less than the negative threshold value, wherein the first neck detection prohibiting signal prohibits the determining of whether a neck is formed for a first predetermined period of time beginning at the determination of the calculated dv/dt being less than the negative threshold value.

16. (New) The control method for an arc welding apparatus of claim 15,

wherein said determining of whether a neck of a droplet is formed includes sending a neck detection signal from the neck determination part in response to a determination by the neck determination part that the calculated dv/dt is greater than the positive threshold value, and

wherein said sending of the first neck detection prohibiting signal prohibits the determining of whether a neck is formed by preventing said comparing of the calculated dv/dt with the positive threshold value for the first predetermined period of time, or by preventing said sending of the neck detection signal for the first predetermined period of time.

17. (New) The control method for an arc welding apparatus of 15, further comprising:

sending a second neck detection prohibiting signal from the neck detection prohibiting part to the neck determination part in response to a determination by the neck prohibiting detection part that the calculated dv/dt becomes less than the negative threshold value during the first predetermined period of time, wherein the second neck detection prohibiting signal prohibits the determining of whether a neck is formed for a second predetermined period of time beginning at the determination of the calculated dv/dt becoming less than the negative threshold value during the first predetermined period of time.

18. (New) An arc welding apparatus comprising:
a voltage detector for detecting a welding voltage;
a voltage change amount detection part for calculating dv/dt , wherein dv/dt is a change amount of the welding voltage per unit time detected by said voltage detector;
a neck determination part for determining whether a neck of a droplet is formed by comparing the calculated dv/dt with a positive threshold value; and
a neck prohibiting detection part for comparing the calculated dv/dt with a negative threshold value, wherein said neck prohibiting detection part outputs a first neck detection prohibiting signal to said neck determination part in response to a determination that the calculated dv/dt is less than the negative threshold value, wherein the first neck detection prohibiting signal prohibits said neck determination part from determining whether a neck is formed for a first predetermined period of time beginning at the determination of the calculated dv/dt being less than the negative threshold value.

19. (New) The arc welding apparatus of claim 18, wherein said neck determination part outputs a neck detection signal in response to a determination by said neck determination part that the calculated dv/dt is greater than the positive threshold value, and
wherein the first neck detection prohibiting signal prohibits said neck determination part from determining whether a neck is formed by preventing said neck determination part from comparing the calculated dv/dt with the positive threshold value for the first predetermined period of time, or by preventing said neck determination part from outputting the neck detection signal for the first predetermined period of time.

20. (New) The arc welding apparatus of claim 18, wherein said neck prohibiting detection part outputs a second neck detection prohibiting signal to said neck determination part in response to a determination by said neck prohibiting detection part that the calculated dv/dt becomes less than the negative threshold value during the first predetermined period of time, wherein the second neck detection prohibiting signal prohibits said neck determination part from determining whether a neck is formed for a second predetermined period of time beginning at the determination of the calculated dv/dt becoming less than the negative threshold value during the first predetermined period of time.